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BUSINESS SYSTEMS MODERNIZATION

IRS Needs to Better Balance Management Capacity with Systems Acquisition Workload



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Abstract Pursuant to the Department of the Treasury s fiscal year 2002 appropriations act,the Internal Revenue Service (IRS),in November 2001, submitted to the congressional appropriations committees its fifth expenditure plan,requesting \$391 million from its Business Systems Modernization (BSM)fund.1 As required by the act,we reviewed the plan. Our objectives were to (1)determine whether the plan satisfied the conditions specified in the act,2 (2)determine IRS s progress in implementing modernization management controls and capabilities,and (3)provide any other observations about the plan and IRS s BSM program.		
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BUSINESS SYSTEMS MODERNIZATION

IRS Needs to Better Balance Management Capacity with Systems Acquisition Workload

Highlights of [GAO-02-356](#), a report to the Subcommittee on Treasury and General Government, Senate Committee on Appropriations and the Subcommittee on Treasury, Postal Service and General Government, House Committee on Appropriations.

Why GAO Did This Study

The Internal Revenue Service (IRS) has underway a multiyear, multibillion-dollar business systems modernization program. Since 1995, GAO has designated this program high-risk, in part because of its size and complexity and its immense importance to improving IRS mission performance and accountability. The Congress has mandated that GAO review IRS's plans for spending funds on this program. This study responds to that mandate by providing the results of GAO's review of IRS's November 2001 expenditure plan.

What GAO Recommends

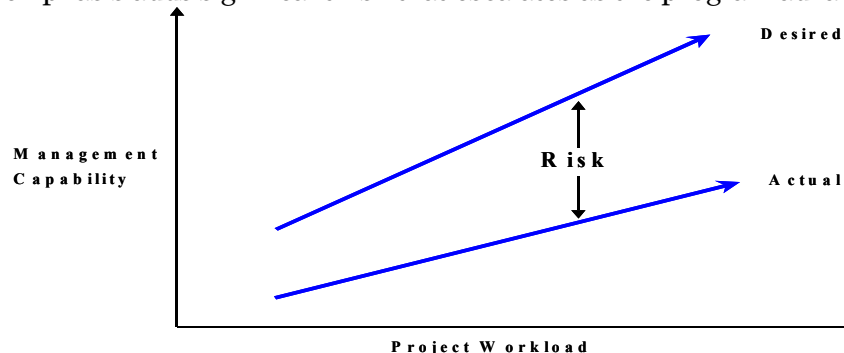
To address the escalating risks facing IRS in this critical program, GAO recommends that the IRS commissioner reconsider the planned scope and pace of the program as defined in the November 2001 expenditure plan. This is necessary to better balance the number of systems acquisition projects underway and planned with IRS's capacity to manage this workload. GAO is providing specific recommendations to the commissioner on how to strike such a balance. In response, the commissioner agreed with GAO's recommendations, and described planned and ongoing efforts to address each.

What GAO Found

IRS's November 2001 expenditure plan defines the next incremental set of management and systems acquisition activities that are intended to move IRS closer to its systems modernization. Related to the activities proposed in this plan, IRS has to date made important progress in establishing the systems infrastructure needed to allow the introduction of future business application systems. Similar progress has also been made in establishing the key modernization management controls needed to achieve the kind of systems acquisition activities provided for in this plan. Nevertheless, as IRS moves forward to implement the plan, it faces increasing risk that it will be unable to deliver promised system capabilities on time and within budget. Reasons for this include:

- IRS lacks certain modernization management controls and capabilities. For example, it lacks a human capital management strategy for the program and a reliable project cost-estimating process. It has also yet to implement mature systems and software acquisition process controls; its plans for correcting this allow core modernization projects to continue for at least 2 more years without such controls.
- Interdependencies among ongoing systems acquisition projects and the complexity of associated activities to be performed during the period covered by the plan are an order of magnitude greater than those of the previous plan. This workload increase raises concern, because IRS was not able to meet many of the project cost and schedule commitments made in the less demanding prior plan.
- IRS's plan provides for increasing its workload by starting additional projects that will further tax existing capability.

In attempting to balance the need for introducing modern systems and their associated benefits as soon as possible, with the need for greater management capacity to ensure that these systems are introduced successfully, IRS's November 2001 plan emphasizes the former. This emphasis adds significant risk that escalates as the program advances.



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Abbreviations

BSM	Business Systems Modernization
IRS	Internal Revenue Service
OMB	Office of Management and Budget
SA-CMM	Software Acquisition Capability Maturity Model



United States General Accounting Office
Washington, D.C. 20548

February 28, 2002

The Honorable Byron L. Dorgan
Chairman
The Honorable Ben Nighthorse Campbell
Ranking Minority Member
Subcommittee on Treasury and General Government
Committee on Appropriations
United States Senate

The Honorable Ernest J. Istook, Jr.
Chairman
The Honorable Steny H. Hoyer
Ranking Minority Member
Subcommittee on Treasury, Postal Service
and General Government
Committee on Appropriations
House of Representatives

Pursuant to the Department of the Treasury's fiscal year 2002 appropriations act, the Internal Revenue Service (IRS), in November 2001, submitted to the congressional appropriations committees its fifth expenditure plan, requesting \$391 million from its Business Systems Modernization (BSM) fund.¹ As required by the act, we reviewed the plan. Our objectives were to (1) determine whether the plan satisfied the conditions specified in the act,² (2) determine IRS's progress in implementing modernization management controls and capabilities, and (3) provide any other observations about the plan and IRS's BSM program.

On December 10 and 11, 2001, we briefed your respective offices on the results of our review. This report transmits the materials used at those briefings, and reiterates the recommendations to the commissioner of internal revenue that we specified in the briefings. The full briefing

¹ The Treasury and General Government Appropriations Act, 2002 (P. L. 107-67).

² The act specifies that BSM funds are unavailable until IRS submits to congressional appropriations committees for approval a modernization expenditure plan that (1) meets the Office of Management and Budget's (OMB) capital planning and information technology investment control review requirements; (2) complies with IRS's enterprise architecture; (3) meets IRS's life-cycle management requirements; (4) is approved by IRS, Treasury, and OMB; (5) is reviewed by GAO; and (6) complies with federal acquisition requirements and management practices.

materials, including our scope and methodology, are reprinted in appendix I. In summary, we made the following five major points:

- IRS's November 2001 expenditure plan satisfied the conditions specified in the appropriations act. However, while the plan provided for satisfying these conditions, IRS must still fully implement the controls and capabilities described in the plan.
- Since our June 2001 report,³ IRS has made important progress in implementing modernization management controls and capabilities and addressing our past recommendations. Nevertheless, IRS's modernization management capacity is still not where it needs to be, given (1) the number of systems acquisition projects that the November 2001 plan identifies as being underway, (2) the fact that several of these ongoing projects have already entered the critical building stage of their life cycles (milestone 3) and are to begin deployment (milestone 4) during this year, and (3) IRS's plan to begin additional projects. Examples of modernization management controls and capabilities that are not yet fully implemented include software acquisition management,⁴ configuration management,⁵ quality assurance, risk management, enterprise architecture⁶ implementation, human capital management, integrated program scheduling, and cost and schedule estimating.
- The increased risk of IRS's proceeding without these controls and capabilities has contributed to actual project cost, schedule, and performance shortfalls. For example, in the fifth plan, IRS reports that the Customer Account Data Engine's (release 1) milestone 4 date has been delayed by 6 months, and its cost has increased by \$5 million (13

³ U.S. General Accounting Office, *Business Systems Modernization: Results of Review of IRS's March 2001 Expenditure Plan*, GAO-01-716 (Washington, D.C.: June 29, 2001).

⁴ Carnegie Mellon University's Software Engineering Institute has developed criteria, known as the Software Acquisition Capability Maturity Model® (SA-CMM®), for determining organizations' software acquisition management effectiveness or maturity. Capability Maturity Model and CMM are registered in the U.S. Patent and Trademark Office.

⁵ Configuration management is the means for ensuring the integrity and consistency of systems modernization programs and project products throughout their life cycles. Through effective configuration management, for example, integration among related projects and alignment between projects and the enterprise architecture can be achieved.

⁶ An enterprise architecture is an institutional blueprint defining how an enterprise operates today, in both business and technological terms, and how it wants to operate in the future. It also includes a roadmap for transitioning between these environments.

percent above the fourth plan's funding level). Also, since submitting the fifth plan for approval, IRS announced that the Security and Technology Infrastructure Release's milestone 4 date has been delayed by 3 months, and its cost has increased by \$6 million (24 percent above the fourth plan's funding level).

- IRS acknowledges the need to strengthen its modernization management controls, and recognizes that these controls become more critical as the size and complexity of the BSM program continues to increase. It also has actions underway to fully implement these controls and, until then, plans to compensate for their immaturity by applying experienced human capital.
- In our view, reliance on a combination of existing immature processes and individual expertise and heroic efforts is a short-term solution to a long-term need. Given that the immaturity of these controls has already contributed to project cost, schedule, and performance shortfalls, and will likely continue to do so, IRS needs a better strategy for mitigating the risks it faces in implementing its fifth expenditure plan. To assist IRS in striking a proper balance between the need to quickly introduce modernized systems yet prudently manage the risks inherent in such an undertaking, we made the following recommendations to the commissioner of internal revenue.

Recommendations for Executive Action

To address the escalating risks facing IRS on its BSM program, we recommend that the commissioner of internal revenue reconsider the planned scope and pace of the BSM program as defined in the fifth expenditure plan, with the goal of better balancing the number of systems acquisition projects underway and planned with IRS's capacity to manage this workload. At a minimum, the commissioner's reconsideration should include

- slowing ongoing projects and delaying new project starts to reduce Business Systems Modernization Office resource demands,
- making correcting modernization management weaknesses a top priority and a matter of top management attention, and
- reapplying resources—financial and human capital—available from slowed and delayed projects toward correction of control weaknesses.

We further recommend that the commissioner take the following actions with respect to each of the modernization management weaknesses that we identified.

First, for software acquisition management,

- immediately assess critical BSM projects (i.e., Customer Account Data Engine, Security and Technology Infrastructure Release, and e-Services) against the Software Engineering Institute's Software Acquisition Capability Maturity Model® (SA-CMM®) level 2 requirements;
- based on this assessment, develop a plan for correcting identified weaknesses for these projects, including having an independent SA-CMM evaluation performed on them before submission of the next BSM expenditure plan;
- submit, with the next expenditure plan, the results of this independent evaluation, along with a plan for ensuring that all BSM projects that have passed milestone 3 will meet SA-CMM level 2 requirements; and
- require all projects that did not pass milestone 3 as of December 31, 2001, to be assessed as SA-CMM level 2, and have a plan for correcting any project weaknesses found as a condition of milestone 3 approval.

Second, for configuration management, risk management, enterprise architecture implementation, human capital strategic management, integrated program scheduling, and cost and schedule estimating, ensure that commitments discussed herein for addressing residual weaknesses are implemented as planned, and report any deviations from these planned commitments to IRS's appropriations subcommittees.

Third, until contractor quality assurance weaknesses are corrected, increase the level of IRS oversight, scrutiny, and quality assurance of contractor activities.

Finally, to allow for effective congressional oversight of the program, we reiterate our prior recommendation that the commissioner report to IRS's appropriations subcommittees any changes to expenditure plan commitments concerning systems requirements/capabilities to be delivered and the associated benefits to be realized, and continue to report such performance measures in future expenditure plans.

Agency Comments

In commenting on a draft of this report, the commissioner of internal revenue agreed with our recommendations, adding that IRS leadership understands the importance of correcting the issues that we identified and is moving aggressively to resolve them. In this regard, the commissioner described IRS's ongoing and planned efforts relating to addressing each of

our recommendations. The commissioner's written comments are reprinted in appendix II.

We are sending copies of this report to the chairmen and ranking minority members of other Senate and House committees and subcommittees that have appropriations, authorization, and oversight responsibilities for the Internal Revenue Service. We are also sending copies to the commissioner of internal revenue, the secretary of the treasury, the chairman of the IRS oversight board, and the director of the Office of Management and Budget. Copies are also available at our Web site at www.gao.gov.

Should you or your offices have questions on matters discussed in this report, please contact me at (202) 512-3439. I can also be reached by e-mail at hiter@gao.gov. Key contributors to this report are listed in appendix III.

A handwritten signature in black ink, reading "Randolph C. Hite". The signature is fluid and cursive, with the first name "Randolph" being the most prominent.

Randolph C. Hite
Director, Information Technology Architecture
and Systems Issues

Briefing Slides from December 10 and 11, 2001, Briefings to the Senate and House Appropriations Subcommittee Staffs



Information Technology

Results of Review of IRS' November 2001 Business Systems Modernization Expenditure Plan

Briefing to the Staffs of
the Senate Committee on Appropriations,
Subcommittee on Treasury and General Government
(on December 11, 2001)
and
the House Committee on Appropriations,
Subcommittee on Treasury, Postal Service,
and General Government
(on December 10, 2001)



Briefing Overview

- Introduction
- Objectives
- Scope and Methodology
- Background
- Results in Brief
- Results
- Conclusions
- Recommendations



Introduction

- As mandated by IRS' FY 2002 appropriations act, Business Systems Modernization (BSM) funds are unavailable until IRS submits to the congressional appropriations committees for approval, a modernization expenditure plan that:
 - Meets the Office of Management and Budget's (OMB) capital planning and information technology (IT) investment control review requirements;
 - Complies with IRS' enterprise architecture;¹
 - Meets IRS life cycle management requirements;²
 - Is approved by IRS, Treasury, and OMB;
 - Is reviewed by GAO; and
 - Complies with federal acquisition requirements and management practices.
- Since mid-1999, IRS has submitted a series of expenditure or "spending" plans requesting release of BSM appropriated funds.

¹An Enterprise Architecture (EA) is an institutional blueprint defining how an enterprise operates today, in both business and technology terms, and how it wants to operate at some point in the future. An EA also includes a roadmap for transitioning between these environments.

²IRS refers to its life cycle management program as the Enterprise Life Cycle (ELC), which is graphically depicted in the Background Section.



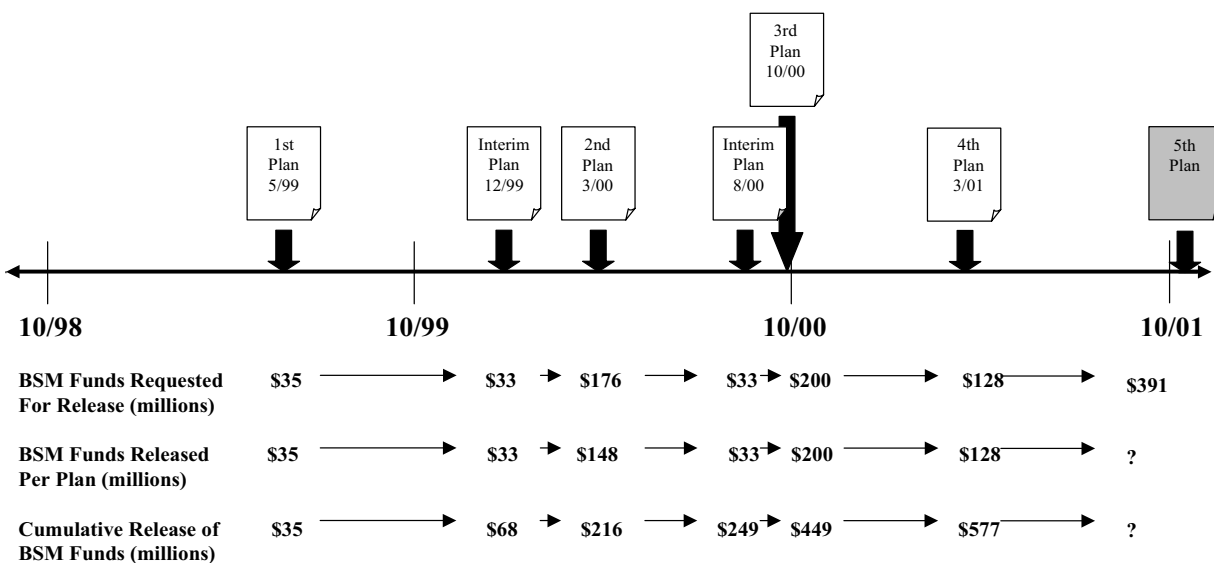
Introduction

- To date, about \$968 million has been appropriated for BSM, including about \$391 million for FY 2002. Of the \$968, \$577 million has been released; about \$391 million remains.
- On November 13, 2001, IRS submitted its fifth plan, seeking release of the remaining \$391 million.
- If the plan is approved, the BSM fund will have a zero balance. To replenish the fund, IRS plans to request \$450 million via its FY 2003 budget request.

Appendix I
Briefing Slides from December 10 and 11,
2001, Briefings to the Senate and House
Appropriations Subcommittee Staffs



Introduction



? - Amount to be determined



Objectives

- As agreed with IRS' appropriations subcommittees, our objectives were to
 - determine whether the fifth expenditure plan satisfies the legislative conditions,
 - determine what progress IRS has made in implementing modernization management controls and capabilities, and
 - provide any other observations about the fifth plan and IRS' BSM program.



Scope and Methodology

- To accomplish our objectives, we
 - Reviewed the fifth expenditure plan and met with IRS program officials to understand the scope and content of the plan;
 - Analyzed the plan against the legislative conditions to identify any variances;
 - Reviewed program and project management reports and briefings to assess progress in implementing modernization management controls and capabilities;
 - Observed modernization executive steering committee and subcommittee meetings to, among other things, document how the plan was developed and reviewed;
 - Interviewed program and project management officials to corroborate our understanding of the plan and other BSM activities.



Scope and Methodology

- Analyzed available evidence on recent efforts to implement modernization management controls and capabilities. Specifically, we analyzed progress and plans for
 - enterprise architecture (EA) definition and implementation,
 - ELC definition and implementation, including configuration management, quality assurance and risk management,
 - software acquisition maturity, as defined by the Software Engineering Institute's (SEI) Software Acquisition Capability Maturity Model™ (SA-CMM),
 - human capital management,
 - cost and schedule estimating practices,
 - integrated program schedule development, and
 - key projects, such as the Security and Technology Infrastructure Release (STIR), the Customer Account Data Engine (CADE), e-Services, and the Internet Refund and Fact of Filing project.



Scope and Methodology

- Collaborated with the Treasury Inspector General for Tax Administration (TIGTA) to avoid duplication of effort in reviewing BSM initiatives and incorporated TIGTA results in this briefing where appropriate.
 - Projects addressed by TIGTA included Customer Communications, e-Services, the Telecommunications Enterprise Strategic Program, and Customer Relationship Management-Exam.
 - Program-level processes addressed in a recent capping report on key system development processes (e.g. requirements management, configuration management, risk management).



Scope and Methodology

- As agreed with your offices, we did not independently validate planned initiatives' cost estimates or confirm, through system and project management documentation, the validity of IRS-provided information on the initiatives' content and progress.
- We provided a draft of this briefing on December 7, 2001, to IRS BSM program executives (Deputy Associate Commissioners for Program Management and Systems Integration and the Executive Program Advisor for Risk Management), and have incorporated their comments where appropriate.
- We performed our work from October through December 2001 in accordance with generally accepted government auditing standards.



Background

Summary of IRS' Fifth Expenditure Plan (\$000)³

Program Management and Architecture Activities

Program Management Office	\$ 7,918
Business Transformation Planning	\$ 10,461
Architecture & Systems Integration	\$ 32,539
Quality Management and Assurance	\$ 10,082
Federally Funded Research and Development Center - MITRE	<u>\$ 18,070</u>
<i>Subtotal</i>	<i>\$ 79,070</i>

Project Level and Infrastructure Activities⁴

Core Infrastructure Support Projects (e.g. STIR)	\$107,959
Business Systems Support Projects (Customer Account Data Engine, Custodial Accounting Project, Core Financial Systems)	\$112,224
Business Systems Projects	<u>\$ 89,686</u>
<i>Subtotal</i>	<i>\$309,869</i>

Addition to Management Reserve	\$ 2,061
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Total	<u>\$391,000</u>
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Source: IRS

³See appendix I for a more detailed summary of the plan.

⁴The 3 categories under this heading include 16 separate projects.



Background

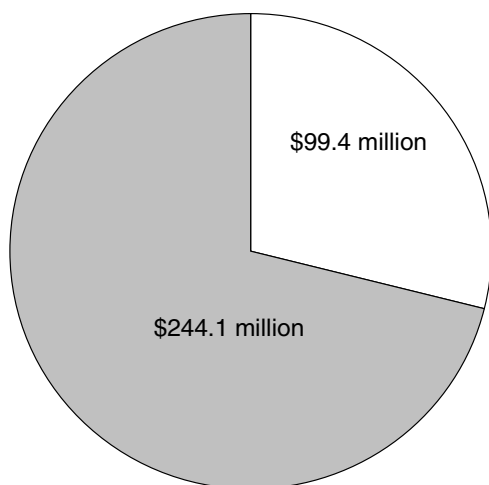
- IRS' plan is to (1) continue ongoing program-level initiatives through mid-November 2002 and 16 ongoing projects to their next milestones and (2) start 6 new projects. Examples of new projects are
 - Reporting Compliance, which is to, among other things, select returns for examination
 - Filing and Payment Compliance, which is to enable access to taxpayer data in CADE and the Custodial Accounting Project system to determine compliance and allow taxpayers to resolve account issues electronically
- Compared to the total BSM funds requested in the third and fourth plans combined, the fifth plan represents an 18 percent decrease in program management spending and a 27 percent increase in project acquisition spending.
- The third and fourth plans generally provided funding for FY 2001, and the fifth plan does so for FY 2002.

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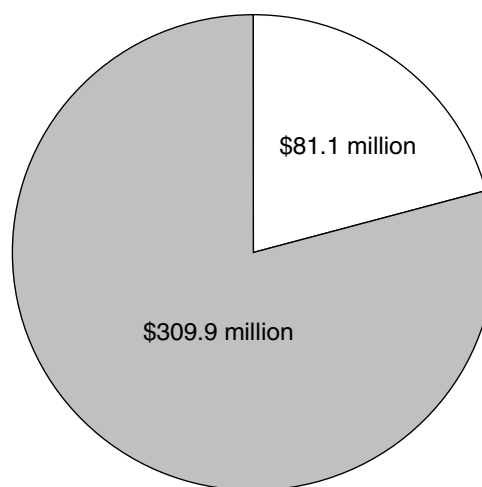


Background

3rd and 4th Plans
(\$343 million)



5th Plan
(\$391 million)



☐ Program Management Spending ☒ Project Acquisition Spending



Background

- Like its previous plans, IRS' fifth expenditure plan covers contractor costs, such as the Prime Systems Integration Support (PRIME) contractor and the systems engineering and technical assistance contractor (MITRE), and not IRS internal costs, such as IRS BSM program office (BSMO) staff costs. As we previously reported,⁵
 - IRS' actual use of prior BSM funding has been limited to the modernization program
 - IRS' actual use of prior IS funding has included modernization activities.

⁵Internal Revenue Service: Results of Review of IRS Spending for Business Systems Modernization (GAO-01-920, August 17, 2001).



Background

Summary of Prior GAO Expenditure Plan Reviews

- To date, GAO has reviewed and reported on six requests for BSM funding releases.⁶
 - Since mid-1999, we have reported⁷ on the risks associated with IRS' approach of concurrently building systems while developing and implementing program management capabilities such as having a fully operational program management office and implementing the ELC.

⁶For details on our past review results, see appendix II.

⁷For example, see *Business Systems Modernization: Results of Review of IRS' March 2001 Expenditure Plan* (GAO-01-716, June 29, 2001). and *Internal Revenue Service: Progress Continues But Serious Management Challenges Remain* (GAO-01-562T, April 2, 2001).



Background

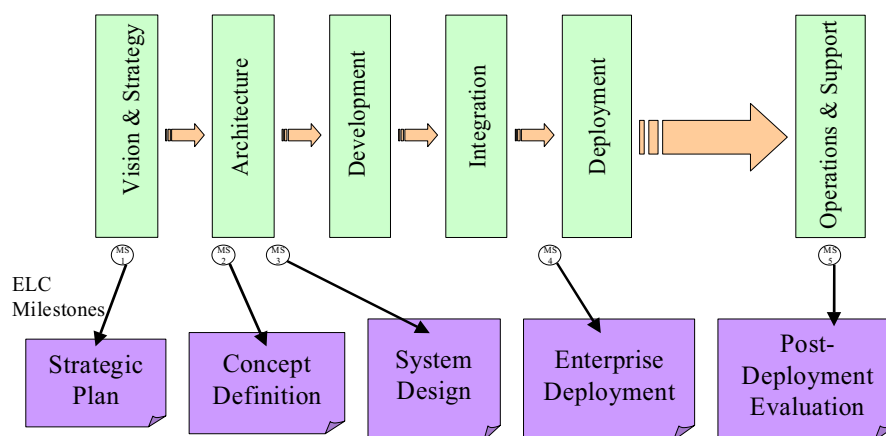
- In summary, we reported that attempting to acquire modernized systems before having the requisite management capability increases the risk that systems will experience cost, schedule, and performance shortfalls.
- EA, configuration management, quality assurance, and risk management, are but four of many management controls required under IRS' ELC, which is a structured method for managing system modernization program and project investments throughout their life cycles (see below simplified diagram of ELC).



Background

IRS' Enterprise Life Cycle Phases and Milestones

ELC Phases





Background

- We have also reported⁸ that the risks associated with building systems without the requisite management controls are not as severe early in projects' life cycles when they are being planned (project definition and preliminary system design), but escalate as projects are built (detailed design and development) and implemented (enterprise deployment).
- In the case of IRS and its ELC, this point of risk escalation is ELC Milestone 3, as is shown in the following graphic. From this point through deployment (Milestone 4) to operations and support (Milestone 5), risk can increase significantly.
- In June 2001 report,⁹ we identified key IRS projects that were approaching or had passed Milestone 3 that were beginning to experience such cost, schedule, and performance shortfalls, and concluded that program risks were increasing (see graphic on next page).

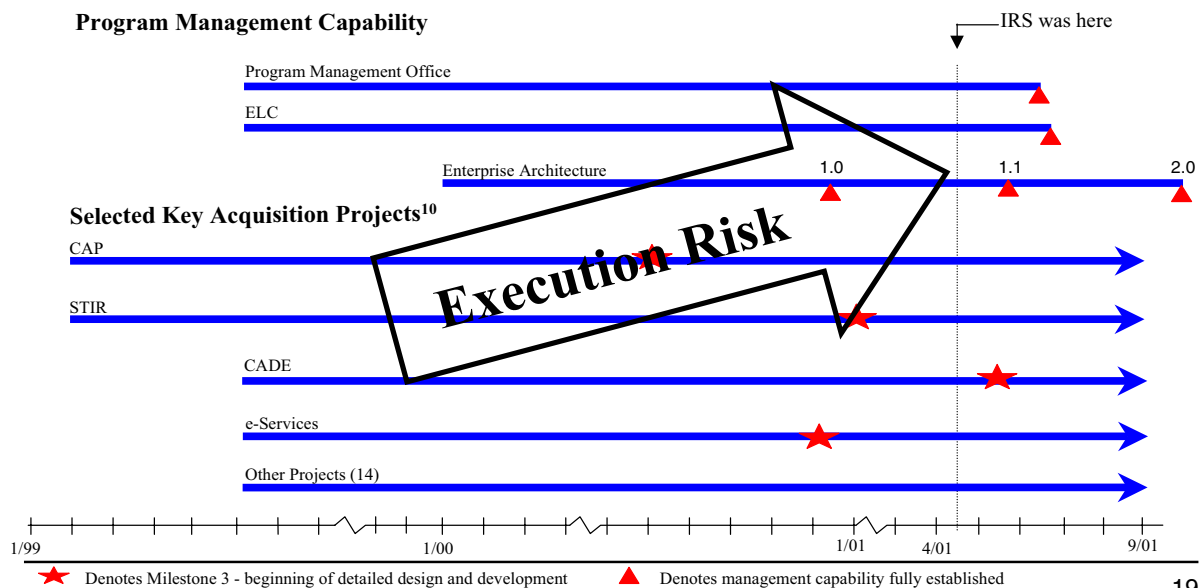
⁸For example, see *Tax Systems Modernization: Results of Review of IRS' Third Expenditure Plan* (GAO-01-227, January 22, 2001).

⁹*Business Systems Modernization: Results of Review of IRS' March 2001 Expenditure Plan* (GAO-01-716, June 29, 2001).



Background

Timeline Depicting Escalating Program Execution Risk as of April 2001



¹⁰ 4 of 18 total acquisition projects



Results in Brief

- IRS' fifth plan satisfies each of six legislative conditions.

Legislative Conditions	Satisfies	Does Not Satisfy
1. Meets OMB capital planning and investment control review requirements.	✓	
2. Complies with IRS' enterprise architecture.	✓	
3. Meets the requirements of IRS' life cycle program.	✓	
4. Approved by IRS, Treasury, and OMB.	✓	
5. Reviewed by GAO.	✓	
6. Complies with federal acquisition requirements and management practices. ¹¹	✓	

- While the plan provides for satisfying these conditions, IRS still has to fully implement the controls and capabilities described in the plan.

¹¹These acquisition requirements and practices are intended to establish acquisition management rigor and discipline, such as those defined in the Software Engineering Institute's acquisition model. Our analysis of the plan focused on satisfaction of this model's tenets.



Results in Brief

- Nevertheless, IRS' modernization management capability is still not where it should be given (1) the number of acquisition projects that are underway, (2) the fact that several of these projects have already entered the critical building stage of their life cycles (Milestone 3) and are to begin deployment (Milestone 4) during calendar year 2002, and (3) IRS' plan to begin additional projects.
- Modernization management controls and capabilities that are not yet fully implemented are
 - Software acquisition management
 - Configuration management
 - Quality assurance
 - Risk management
 - EA implementation
 - Human capital management,
 - Integrated program scheduling, and
 - Cost and schedule estimating



Results in Brief

- The increased risk of proceeding without these controls and capabilities is now contributing to actual project cost, schedule, and performance shortfalls. For example,
 - In the fifth plan, IRS reports that CADE's (Release 1) Milestone 4 date has slipped by 6 months, and its cost has increased by \$5 million (13% above the fourth plan's funding level), and
 - Since submitting the fifth plan for approval, IRS announced that STIR's Milestone 4 date has slipped by 3 months, and its cost has increased by \$6 million (24% above fourth plan funding level).



Results in Brief

- Since IRS submitted its fifth plan, we shared our findings and conclusions with IRS. In response, IRS
 - acknowledges the need to strengthen its modernization management controls,
 - recognizes these controls are more critical as the size and complexity of the BSM program continues to increase, and
 - has efforts underway intended to fully implement these controls, and until then, plans to compensate for their immaturity by applying experienced human capital.



Results in Brief

- In our view, reliance on a combination of existing immature processes and individual expertise and heroic efforts is a short-term solution to a long-term need. Given that these controls' immaturity have already contributed to project cost, schedule, and performance shortfalls, and will likely lead to future shortfalls, IRS needs a better strategy for mitigating the risks it faces in implementing its fifth expenditure plan.
- To assist IRS in striking a proper balance between the need to quickly introduce modernized systems and prudently manage the risks inherent in doing so, we are making recommendations to the Commissioner of Internal Revenue.



Results

Objective 1: Fifth plan satisfies the conditions in IRS' FY 2002 appropriations act.

Legislative Conditions	Expenditure Plan Provisions
1. Meets the OMB capital planning and IT investment control review requirements.	IRS' fifth expenditure plan provides for managing investments as part of a portfolio through its Investment Decision Management process. This includes conducting periodic portfolio reviews to assess changes in business priorities and project schedules. The fifth plan provides for such an assessment in January 2002. The fifth plan also provides for IRS to revise and implement its business case guidance to achieve better system investment decisions based on compelling return-on-investment justifications.

Appendix I
Briefing Slides from December 10 and 11,
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Appropriations Subcommittee Staffs



Results

Legislative Conditions	Expenditure Plan Provisions
2. Complies with IRS' enterprise architecture.	<p>The fifth plan provides funds to continue definition and implementation of the enterprise architecture. For example, it provides for</p> <ul style="list-style-type: none"> • addressing issues raised during review and approval of EA releases 1.0 and 1.1 • completing and issuing EA release 2.0 • addressing EA compliance certification for selected projects • issuance of the 2002 and 2003 release architectures • operation of the architecture engineering office
3. Meets the requirements of IRS' life cycle program.	<p>The plan provides funds for meeting the requirements in IRS' life cycle management program, which IRS refers to as ELC. For example, the plan calls for</p> <ul style="list-style-type: none"> • maintaining responsibility for coordinating, tracking, and integrating all program-wide costs, schedules, releases, issues, and risks • maintaining the ELC • completing the implementation of configuration management, including establishing configuration items for existing (legacy) systems impacted by near-term modernization projects (project releases to be deployed in 2002 and 2003), and developing and controlling a configuration management master log.

Appendix I
Briefing Slides from December 10 and 11,
2001, Briefings to the Senate and House
Appropriations Subcommittee Staffs



Results

Legislative Conditions	Expenditure Plan Provisions
4. Approved by IRS, Treasury, and OMB.	<ul style="list-style-type: none"> • IRS – September 17, 2001 • Treasury – October 19, 2001 • OMB – October 29, 2001 • Submitted to IRS' appropriations subcommittees – November 13, 2001
5. Reviewed by GAO.	<ul style="list-style-type: none"> • GAO – December 10, 2001 briefing to IRS' House appropriation subcommittee – December 11, 2001 briefing to IRS' Senate appropriation subcommittee
6. Complies with the acquisition rules, requirements, guidelines, and systems acquisition management practices of the federal Government.	As part of the ELC, IRS has defined processes, roles, responsibilities, etc. for implementing Software Engineering Institute (SEI) Software Acquisition Capability Maturity Model™ practices within the level 2 key process areas. ¹² These practices are consistent with federal acquisition requirements and management practices, and the plan calls for implementation of the ELC on all projects.

¹²These are Acquisition Planning, Solicitation, Requirements Development and Management, Project Management, Contract Tracking and Oversight, Evaluation, and Transition to Support.



Results

Objective 2: Despite important progress, key controls and capabilities have not yet been implemented.

- Since we reported on IRS' last plan,¹³ IRS has made important progress in implementing modernization controls and capabilities and addressing our recommendations.
- However, key controls and capabilities are still not fully implemented.

IRS Commitments Made in March 2001 and Previous Plans to Address Weaknesses and Recommendations	Completed	Not Completed	Revised Commitments in November 2001 Plan
Mature software acquisition capabilities			
▪ Have all projects follow SA CMM level 2 processes by September 2001.		✓ (See pp. 30-32)	All projects to satisfy SA CMM level 2 requirements during FY 2004.
▪ Perform internal SA CMM level 2 capability compliance assessment by September 2001.		✓ (See pp. 30-32)	Internal assessment by June 2002.
▪ Have an external evaluation (SCE) performed by independent assessor in March 2002 to ensure compliance with SEI's SA CMM level 2 requirements.		✓ (See p. 30-32)	External evaluation in December 2002.

¹³Business Systems Modernization: Results of Review of IRS' March 2001 Expenditure Plan (GAO-01-716, June 29, 2001).

Appendix I
Briefing Slides from December 10 and 11,
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Results

IRS Commitments Made in March 2001 and Previous Plans to Address Weaknesses and Recommendations	Completed	Not Completed	Revised Commitments in Nov. 2001 Plan
ELC definition and implementation (Configuration Management, Quality Assurance, Risk Management)			
Configuration Management:			
▪ Fully define and institutionalize PRIME standard configuration management procedures by July 2001.	✓		
▪ Fully define and institutionalize BSMO standard configuration management procedures by July 2001.		✓ (See pp. 35-36)	To be completed by early 2002.
▪ Establish configuration item baselines for 2002 Release modernization projects by May 2001.	✓		
▪ Identify configuration items for current production environment impacted by near-term (2002 and 2003) modernization project releases by November 2001.		✓ (See pp. 35-36)	2002 project releases by March 2002. 2003 project releases date not yet established.
▪ Establish a centralized CM repository by November 2001.		✓ (See pp. 35-36)	To be completed by early 2002.
Quality Assurance:			
▪ Implement BSM program office quality assurance function by November 2001.	✓		
Risk Management:			
▪ Complete definition of risk management program by November 2001.	✓		
▪ Complete initial training of BSMO/PRIME personnel by November 2001.	✓		
▪ Fully implement risk management program by November 2001.		✓ (See pp. 41-42)	To be completed by February 2002.
Enterprise Architecture (EA)			
▪ Approve EA 1.1.	✓		
▪ Ensure ongoing projects are aligned with EA in accordance with compliance certification process.		✓ (See p. 44-45)	To be completed by late-December 2001.



Results

IRS Has Not Implemented Effective Software Acquisition Processes

- The Clinger-Cohen Act requires the establishment of effective IT management processes. SEI's Software Acquisition Capability Maturity Model™ defines such processes for managing software acquisitions. Since 1995, we have recommended that IRS establish, at a minimum, the "repeatable" level of SEI's software acquisition management processes (Level 2).¹⁴
- IRS has not completed implementation of SEI's Level 2 software processes, although it committed in its fourth plan to do so by September 2001.

¹⁴*Tax Systems Modernization: Management and Technical Weaknesses Must Be Corrected If Modernization Is to Succeed* (GAO/AIMD-95-156, July 26, 1995).



Results

- IRS officials attribute the delay to their underestimation of how long it takes to implement the practices.
- To effectively implement mature acquisition management processes, an organization needs to
 - first assess its strengths and weaknesses and
 - then develop a plan for leveraging existing strengths and correcting weaknesses, paying special attention to projects that are most critical and vulnerable to weaknesses.
- To address its acquisition management control weaknesses, IRS has recently
 - engaged SEI to help better estimate how long this will take, and
 - developed a plan for implementing these practices which includes



Results

- focusing first on two new BSM projects,
 - having these two projects internally assessed by June 2002,
 - having these two projects independently evaluated by December 2002, and
 - implementing the practices on remaining BSM projects during FY 2004.
-
- In effect, this plan means that IRS will not implement mature acquisition processes on key projects until after initial system increments have passed critical, later life cycle phases. As a result, IRS will continue to run the risk that these projects' promised capabilities will not be delivered on time and within budget.
 - The significance of this risk is magnified in light of the multiple dependencies that exist among projects, where for example, delays in one can cause cascading delays in others.



Results

IRS Has Made Important Progress, But Does Not Yet Have Effective Configuration Management

- Effective configuration management is an essential control for ensuring the integrity and consistency of system modernization program and project products throughout their life cycles.
- In June 2001, we reported¹⁵ BSM configuration management was ineffective. Accordingly, we made recommendations to address this weakness.

¹⁵Business Systems Modernization: Results of Review of IRS' March 2001 Expenditure Plan (GAO-01-716, June 29, 2001).



Results

- IRS has made important progress in addressing our recommendations. For example, it has
 - identified configuration items and components to be controlled for BSM projects,
 - had the PRIME revise its program configuration management plan and procedures, which was completed in July 2001,
 - trained contractor and selected BSM program office personnel in configuration management,
 - established baselines for approved program and project products,
 - initiated periodic internal configuration management process audits on selected projects to ensure plans and procedures are being followed, and
 - established configuration control boards, including defining thresholds governing which board should address which request.



Results

- However, effective configuration management, as we previously recommended, requires an enterprise-wide configuration management process, including plans and procedures governing PRIME, BSM program office, and IRS IT services organization products and systems. At a minimum, this also involves
 - establishing an integrated program-wide configuration library (i.e., a repository),
 - defining and implementing a program-wide configuration status account reporting mechanism, and
 - identifying configuration items and components for current (legacy) systems affected by near-term (2002 and 2003) BSM project releases.



Results

- IRS officials acknowledge these steps have not been completed but have plans to do so by March 2002, except for the 2003 project releases, for which a date has not yet been established.
- IRS officials also stated that these steps have not yet been fully implemented because all the steps needed to implement an effective configuration management process were not originally understood.
- While IRS has made progress in implementing effective configuration management, until it fully does so, IRS cannot adequately assure that systems are being designed and developed in accordance with enterprise-wide needs and requirements, and thus the likelihood that projects will eventually require expensive re-work is increased.



Results

IRS Quality Assurance Efforts Have Identified PRIME Problems

- Quality assurance (QA) provides independent assessments of whether management process requirements are being followed and whether product standards and requirements are being satisfied.
- In 2000, IRS established a QA organization within its BSM program office to, among other things, determine how well
 - the BSM program office was following ELC acquisition management processes and product standards and
 - the PRIME's QA function was performing its role of assessing the PRIME's adherence to quality processes and standards in producing BSM deliverables.



Results

- IRS reviewed the PRIME's QA function, and in March 2001, reported 5 major findings and concluded that the PRIME's QA was not always effective. Examples of findings were that the PRIME's QA
 - had not planned its work adequately, which contributed to inadequate process audits and product reviews,
 - had not defined program and project metrics for assessing process and product quality, and
 - was not organizationally independent.
- To address these weaknesses, IRS defined 24 corrective actions for the PRIME. As of November 2001, IRS reported that the PRIME had implemented 7 of the corrective actions, but 17 remained open. Examples of open actions are
 - Ensure that QA reviews and approves deliverables before they are transmitted to IRS



Results

- Require PRIME program and project quality plans to adhere to ELC standards.
- Until the PRIME corrects these weaknesses, the probability of PRIME deliverables not meeting expectations is unnecessarily increased, and the level of IRS contract oversight and control needed to compensate for these weaknesses increases.



Results

Despite Progress, Risk Management Not Yet Fully Implemented

- A risk represents a potential problem. The purpose of risk management is to identify program and project risks before they result in a problem, appropriately respond to a risk based on its significance (probability of occurrence times its potential impact), and to actively manage it.
- Effectively managing these risks is one way to minimize the chances of program and project cost, schedule, and performance problems occurring. Consistent with our efforts to constructively engage with IRS on BSM, in 1999 we orally recommended to IRS' former CIO that IRS implement this capability across the BSM program and projects.



Results

- IRS has defined risk management policies and procedures for its ELC. These included processes to
 - identify risks,
 - evaluate probability of occurrence and potential impact on each project and across the BSM program,
 - develop risk mitigation plans and track their disposition,
 - establish a repository to maintain an inventory of identified risks, and
 - report on the status of risks and mitigation plans.
- Despite these steps, IRS has yet to fully implement its risk management program policies and procedures. For example,
 - IRS' inventory of BSM risks does not identify all known risks (e.g. lack of mature software processes, lack of effective configuration management).



Results

- Risk plans and their disposition are not in all cases being tracked and updated.
- To strengthen risk management, IRS hired a senior executive in June 2001 to implement effective risk management. This official
 - attributed IRS' delay in implementing risk management to a lack of incentives to report risks, and
 - created an action team to review IRS' risk management procedures and develop a plan for "revitalizing" the program, including incorporating incentives for escalating risks.
- IRS plans to have risk management fully implemented by February 2002.
- Until this is done, IRS cannot assure it is adequately managing program and project risks. Thus, the likelihood of BSM projects experiencing further cost, schedule, and performance shortfalls is increased.

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Results

IRS Has Established Processes To Certify Alignment of BSM Projects With EA, But Key Projects Yet To Be Certified

- EA is an institutional blueprint defining how an enterprise operates today, in both business and technology terms, and how it wants to operate at some point in the future. An EA also includes a roadmap for transitioning between these environments.
- Since 1995¹⁶, we have recommended that IRS
 - define and implement an EA to guide and constrain the acquisition of its modernized systems and
 - map BSM projects to the EA to ensure they are built in accordance with the EA, which reduces the risk of expensive rework, especially after projects have begun detailed design and development.
- We reported in our June 2001 report¹⁷ that while IRS has developed EA versions 1.0 and 1.1, it had not yet performed the requisite mappings.

¹⁶For example, *Tax Systems Modernization: Management and Technical Weaknesses Must Be Corrected If Modernization Is to Succeed* (GAO/AIMD-95-156, July 26, 1995).

¹⁷*Business Systems Modernization: Results of Review of IRS' March 2001 Expenditure Plan* (GAO-01-716, June 29, 2001).



Results

- Accordingly, we also recommended that IRS not approve projects exiting Milestone 3 until the required assessments were performed to certify that projects are aligned with the EA.
- IRS has taken important steps to implement this recommendation. For example
 - In September 2001, IRS issued processes for certifying project compliance with the EA at Milestone 3, before projects proceed with detailed design and development.
- Nevertheless, IRS has not yet certified all BSM projects that are at or past Milestone 3 via this process and the current EA version, including
 - Security and Technology Infrastructure Release,
 - Internet Refund and Fact of Filing (IRFoF), and
 - Custodial Accounting Project.



Results

- IRS officials stated these projects were delayed in being certified because issuing a draft of EA version 2.0 in October 2001 for comment was their highest priority. Also, STIR and CAP were certified compliant with an earlier EA version. IRS plans to complete certification of these projects by late-December 2001.
- However, until this is done, IRS cannot provide assurance that the project requirements and design are properly aligned with the EA. Without this alignment being established early and continuously throughout a project's life cycle, IRS increases the chances that expensive project rework will be required to meet IRS business and systems needs.



Results

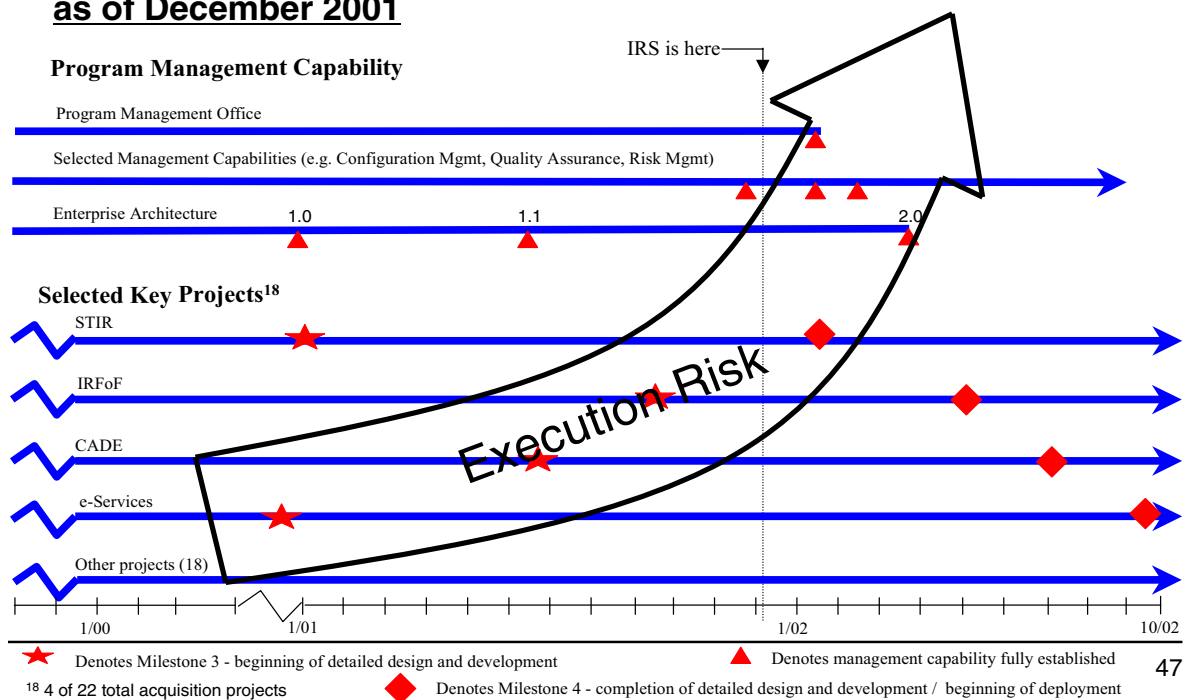
Weaknesses in Controls and Capabilities Increase Risks

- Weaknesses in any one of the aforementioned modernization management controls introduces an unnecessary element of risk to the BSM program, but the combination of these weaknesses introduces a level of risk that increases exponentially over time. Given that the fifth plan provides funding for later phases of key projects, continued development of other projects, and starting of new projects, it is likely that BSM projects will encounter additional cost, schedule, and performance shortfalls. This combination of circumstances and events is represented in the following updated graphic.
- As discussed later in this briefing, IRS reported in the fifth plan that BSM projects have already encountered cost, schedule, and/or performance shortfalls in meeting commitments made in the fourth plan. In those cases where the fifth plan cited a reason for the shortfall, our analysis of the reasons showed that weak management controls were a contributor--either via (1) proactive prudent IRS decision making not to start or continue projects because of immature controls (for example, see Reporting Compliance on p. 51 of this briefing) or (2) immature controls allowed project shortfalls to occur.



Results

Current Timeline Depicting Escalating Program Execution Risk as of December 2001





Results

- IRS acknowledges these risks. According to the CIO, until the weaknesses are fully addressed, IRS is mitigating them by
 - relying on existing immature processes,
 - leveraging the knowledge, skills, and abilities of experienced senior executives to make sure project issues are proactively managed, and
 - hiring additional experienced executives.
- In our view, reliance on a combination of immature processes and individual capabilities and heroic efforts is not a recipe for success. Past government and industry experience shows the probability of repeating successes on projects using this approach is low.



Results

Objective 3: Other observations about IRS' fifth plan and its BSM program

Observation 1: Plan Discloses and Explains Project Cost and Schedule Changes, But Continues to Omit Changes to System Capabilities and Expected Benefits

- In our June 1999 report on IRS' first plan,¹⁹ we recommended that IRS, in future expenditure plans, report progress against incremental project commitments. Since then, we have reported with each plan that IRS has improved its reporting but has not included progress on all incremental project commitments, such as promised system capabilities and expected system benefits.
- In the fifth plan, IRS disclosed that 18 projects have experienced cost and/or schedule shortfalls against commitments made in its fourth and other prior plans.

¹⁹ *Tax Systems Modernization: Results of Review of IRS' Initial Expenditure Plan* (GAO/AIMD-99-206, June 15, 1999).



Results

- Of the 18,
 - 7 were program management initiatives that had cost increases ranging from 1% to 84% (\$150,000 to \$1.9 million), and
 - 11 were system acquisition projects, of which
 - 10 experienced schedule delays ranging from 1.5 months to 14 months; 6 of the 10 experienced delays of 4 months or more; and 1 project had its schedule shortened by 4 months.
 - 8 experienced cost increases ranging from 4% to 66% (\$500,000 to \$6.1 million); 3 had cost decreases ranging from 4% to 23% (\$365,000 to \$4.1 million).



Results

- Examples include²⁰

Program/ Project Management Initiative	Commitment Date and Funding as of 3/2001 (\$000)	Revised Commitment Date and Funding (\$000)	Change (%)
Reporting Compliance- Individual Milestone 2	11/30/01 \$6,022	11/30/02 \$10,000	+12 months +3,978 (66%)
Customer Account Data Engine (CADE) Milestone 4	12/31/01 \$40,038	6/30/02 \$45,338	+6 months +\$5,300 (13%)
Security and Technology Infrastructure Releases (STIR) Milestone 4	9/30/01 \$25,178	1/31/02 \$31,287	+4 months +\$6,109 (24%)

- However, the fifth plan does not provide the level of specificity needed to identify changes, if any, to projects' scope. For example, while the plan discusses the impact of the schedule and cost variances on each project, it does not specify
 - (1) changes to project scope and related benefit expectations or
 - (2) effects on interdependent projects and their benefits.

²⁰A list of 18 is in appendix III.



Results

- In addition, since the plan was completed, other slippages have occurred. For example, on October 23, 2001, IRS moved STIR's Milestone 4 from October 2001 to January 2002, increasing its reported schedule slippage from 1 months to 4 months.
- According to IRS officials, the omission of such scope and benefit information was an oversight, and they plan to correct it in the next expenditure plan.
- By not fully providing scope and benefit change information, congressional oversight of IRS modernization management performance and accountability is constrained.



Results

Observation 2: IRS Beginning to Develop BSM Human Capital Strategy

- As we have previously reported²¹, strategic human capital centers on viewing people as assets whose value to an organization can be enhanced through investment. As the value of people increases, so does the performance capacity of the organization. To maintain and enhance the capabilities of IT staff, organizations should, among other things,
 - assess knowledge and skills needed to effectively perform IT operations to support agency mission and goals,
 - inventory the knowledge and skills of current IT staff,
 - identify gaps between requirements and current staffing, and
 - develop and implement plans to fill the gaps.

²¹Human Capital: Attracting and Retaining a High-Quality Information Technology Workforce
(GAO-02-113T, October 4, 2001)



Results

- IRS has begun to address this issue. For example, it has hired a human capital specialist to develop a plan by January 2002, for defining and implementing an IT human capital strategy.
- Until IRS develops and implements this strategy, it will not know whether it has the right IT knowledge and skills to effectively manage the BSM program. Without this, IRS increases the risk of BSM program and project cost, schedule, and performance shortfalls.



Results

Observation 3: IRS' Integrated Master Schedule Has Yet to be Finalized

- The Integrated Master Schedule is an important tool for managing IRS' acquisition of modernized systems. According to IRS, it is to
 - specify about 20,000 major tasks and associated schedules, involving a dozen organizations, for acquiring and implementing the portfolio of BSM projects, and
 - identify the numerous and complex dependencies across these projects.
- IRS officials recognize the importance of having such an integrated schedule and committed to completing one before they begin implementing FY 2002 system releases (scheduled to begin in January 2002). However, despite important progress, IRS has not yet completed the schedule because
 - implementation plans (through milestone 5) have not yet been developed for all BSM projects to be implemented in FY 2002,



Results

- all change requests that impact BSM projects baselines have not been analyzed, approved, and incorporated into the schedule, and
 - 33 of 61 changes that need to be made to existing (legacy) systems have not yet been analyzed, approved, and incorporated into the schedule.
-
- IRS officials stated that they plan to have the Integrated Master Schedule completed by late December 2001.
 - They attributed the delay in finalizing the schedule to this being the first time IRS has attempted to develop a management tool of this size and complexity, and it has taken longer than anticipated.
 - Until these steps are completed, IRS does not have the means to adequately manage the interdependencies within and among projects, thus increasing the risk of project delays, overruns, and rework.



Results

Observation 4: IRS Has Not Yet Implemented Effective Project Cost and Schedule Estimating Practices

- Producing reliable estimates of expected costs for program-level activities and projects is essential to determining a project's cost-effectiveness. Without this information, the likelihood of poor investment decisions is increased.
- As part of our ongoing constructive engagement with IRS, we have orally recommended to the former and current IRS CIOs that IRS adopt effective cost and schedule estimating practices. SEI defines such practices in its model for evaluating organizational cost and schedule estimating capabilities.²² The practices include having
 - a historical database,
 - structured processes for estimating product size and reuse,
 - extrapolation mechanisms,

²²Software Engineering Institute *Checklists and Criteria for Evaluating the Cost and Schedule Estimating Capabilities of Software Organizations* (CMU/SEI-95-SR-005).



Results

- audit trails,
 - integrity in dealing with dictated costs and schedules, and
 - data collection and feedback processes.
-
- IRS officials recognize the importance of each of these practices. However, IRS is not currently performing them.
 - Consequently and as has been the case in the prior plans, the cost and schedule estimates in IRS' fifth plan are contractor-provided, "rough order of magnitude" estimates, that have not been subjected to meaningful, reliable validation by IRS.
 - IRS officials stated that heretofore they have not been able to dedicate time to implementing effective estimating practices because of other competing program and project priorities.



Results

- However, IRS has tasked the PRIME to develop a plan to implement an estimating capability, that is to include
 - Selection of an estimating method,
 - Development of a plan for implementing the method by mid-January 2002, and
 - Implementation of the plan beginning by the end of February 2002.
- IRS then plans to develop and implement an approach to oversee PRIME estimating efforts by February 2002.
- IRS officials acknowledge that IRS' lack of an effective estimating process has contributed to project delays and cost overruns. Without improved estimation practices, these project shortfalls are likely to continue.



Conclusions

- IRS' fifth plan satisfies the legislative conditions. However, what has and continues to challenge IRS is implementing the planned management controls and capabilities. Since our last report, IRS has made important progress in implementing pockets of modernization management capability. However, this capability is still not where it should be because it has not received the same level of priority and attention as BSM system projects. In our view, these modernization control weaknesses will continue to put IRS at risk of building systems that may not perform as intended, and/or cost more and take longer than necessary to complete.



Conclusions

- Moreover, the risks facing IRS have and will continue to become more severe as projects begin to be built and implemented (ELC Milestones 3 and 4). Consequently, we are particularly concerned about those projects that have or are going to proceed beyond these milestones. This concern is heightened because (1) several of these projects are to provide the foundational infrastructure upon which later projects depend, and (2) these projects are already beginning to experience cost and schedule delays. Exacerbating this situation are IRS' plans to simultaneously start more projects while confronting these other challenges.
- IRS' risk mitigation strategy of relying on experienced executives until control weaknesses are corrected is at best a stop gap measure and is not sufficient given that IRS' timeline for addressing software acquisition weaknesses extends 2 years. Until IRS addresses its management control weaknesses, it will expose BSM to unnecessary risk.



Conclusions

- IRS' fifth plan also does not fully provide whether projects' scope and expected benefit commitments have changed. Such information is critical to congressional oversight of IRS modernization management performance and accountability.



Recommendations for Executive Action

To address the escalating risks facing IRS on its BSM program, we recommend that the Commissioner of Internal Revenue

- reconsider the planned scope and pace of the BSM program as defined in the fifth expenditure plan with the goal of better balancing the number of system acquisition projects underway and planned with IRS' capacity to manage this workload. At a minimum, the Commissioner's reconsideration should include
 - slowing ongoing projects and/or delaying new project starts to reduce BSMO resource demands,
 - making correcting modernization management weaknesses a top priority and a matter of top management attention, and
 - reapplying resources (financial and human capital) available from slowed and delayed projects toward correction of control weaknesses.



Recommendations for Executive Action

- To that end, we further recommend that the Commissioner do the following with respect to each of modernization management weaknesses that we identified.
 - First, for software acquisition management,
 - immediately assess CADE, STIR, and e-Services against SEI SA-CMM level 2 requirements,
 - based on this assessment, develop a plan for correcting identified weaknesses for these projects, including having an independent CMM evaluation performed on these projects before submission of the next BSM expenditure plan,
 - submit with the next expenditure plan, the results of this independent evaluation, along with a plan for ensuring that all BSM projects that have passed milestone 3 will meet CMM level 2 requirements, and
 - require all projects that have not passed milestone 3 as of December 31, 2001, to be assessed as CMM level 2 and have a plan for correcting any project weaknesses found as a condition of milestone 3 approval.



Recommendations for Executive Action

- Second, for configuration management, risk management, EA implementation, human capital strategic management, integrated program scheduling, and cost and schedule estimating, ensure that commitments discussed in this briefing for addressing residual weaknesses are implemented as planned, and report any deviations, from these planned commitments to IRS' appropriations subcommittees.
- Third, until PRIME quality assurance weaknesses are corrected, increase the level of IRS oversight, scrutiny, and quality assurance of PRIME activities.



Recommendations for Executive Action

- In addition, to allow for effective congressional oversight of the program, we reiterate our prior recommendation that the Commissioner report to IRS' appropriations subcommittees on any changes to expenditure plan commitments concerning system requirements/capabilities to be delivered and the associated benefits to be realized, and continue to report such performance measures in future expenditure plans.



Agency Comments

- In commenting on a draft of this briefing, BSM executives stated that they generally agreed with our findings, conclusions, and recommendations.



Appendix I: IRS' Expenditure Plan

BSM Spending Plan, Fiscal Year 2002 (\$000)

Proposed Modernization Initiatives	Milestone	Milestone Date	Amount Requested
Program Level Activities*			
Program Management (formerly Prime Program Management Office)	FY	Nov. 02	\$7,918
Business Integration	FY	Nov. 02	\$10,461
Architecture & Integration	FY	Nov. 02	\$32,539
Management Processes	FY	Nov. 02	\$10,082
FFRDC (MITRE)	FY	Nov. 02	\$18,070
			\$79,070
Core Infrastructure Support Projects*			
Security and Technology Infrastructure Releases	FY	May 02	\$43,973
Infrastructure Shared Services	FY	Nov. 02	\$39,747
Enterprise Systems Management	FY	July 02	\$11,323
Development Integration & Testing Environment	FY	May 02	\$12,916
			\$107,959

*Program Level and Core Infrastructure Support Projects are funded on a fiscal year (FY) basis rather than by milestone.



Appendix I: IRS' Expenditure Plan

Data Projects			
Customer Account Data Engine - MF R1	MS5	Dec. 02	\$5,795
Customer Account Data Engine - IMF R2	MS4	Dec. 02	\$38,400
Customer Account Data Engine - IMF R3	MS3	June 03	\$9,779
Enterprise Data Warehouse R3	MS4,5	May 04	\$4,500
Custodial Accounting Project TASL B1 B2	MS4,5	Feb. 04	\$36,500
Integrated Financial Services/ Core Financial Systems	MS4	Nov. 02	\$17,250
			\$112,224
Business Projects			
IR/FoF R1	MS5	July 02	\$5,000
e-Services 2002	MS4,5	Oct. 03	\$26,092
Customer Account Management	MS3	Oct. 02	\$24,494
Filing & Payment Compliance	MS2,3	Jan. 03	\$14,100
Reporting Compliance - Individual	MS2,3	Nov. 02	\$10,000
HR Connect	MS4,5	Dec. 02	\$10,000
			\$89,686
Addition to Management Reserve			\$2,061
Total Business Systems Modernization Program			\$391,000



Appendix II: Results of Past GAO Reviews

Spending Plan	Results of GAO Review
1st Spending Plan (May 1999) (\$35 million request)	<ul style="list-style-type: none"> The plan satisfied the legislative conditions for the use of ITIA funds and was consistent with our open recommendations. The plan was an appropriate first step, but the key to success would be effective implementation of the plan. Future plans should specify progress against prior plan commitments, and the next plan should clarify IRS/contractor roles and responsibilities. (See <i>Tax Systems Modernization: Results of Review of IRS' Initial Expenditure Plan</i>, GAO/AIMD/GGD-99-206, June 15, 1999)
1st Interim Spending Plan (Dec 1999) (\$33 million request)	<ul style="list-style-type: none"> The plan raised concerns about projects that were scheduled to begin detailed design and software development before, among other things, the enterprise architecture was completed and the ELC was defined and implemented. IRS should expedite completion of the architecture and implementation of the ELC. Future plans should explain how IRS plans to manage the risk of performing detailed design or development work if the architecture is not sufficiently completed or the ELC is not sufficiently implemented.



Appendix II: Results of Past GAO Reviews

Spending Plan	Results of GAO Review
2 nd Spending Plan (Mar 2000) (\$176 million request)	<ul style="list-style-type: none"> IRS met relatively few commitments in its \$35 million first ITIA spending plan, even though the Service later received an additional \$33 million and nearly 5 months of extra time to accomplish the goals set forth in the first plan. The plan satisfied the legislative conditions for the use of ITIA funds, and was generally consistent with recommendations contained in our earlier reports. The key to success would be whether IRS effectively implements the plan. Until IRS completes its initiated actions to redirect and restructure its modernization effort, it would continue to lack key modernization and technical controls. (See <i>Tax Systems Modernization: Results of Review of IRS' March 7, 2000, Expenditure Plan</i>, GAO/AIMD-00-175, May 24, 2000)
2 nd Interim Spending Plan (Aug 2000) (\$33 million request)	<ul style="list-style-type: none"> IRS had not adhered to the approved and funded March 7, 2000, spending plan. On selected initiatives, IRS had not met cost and schedule commitments made in its March 7, 2000 spending plan. Most modernization initiatives had nevertheless made important progress since March 2000. IRS fully addressed two of its modernization management capability weaknesses, and it was making progress in addressing others. One project, Custodial Accounting Project (CAP), had been approved for product development without sufficient definition and without a compelling business case. Further investment in CAP should be limited until IRS demonstrates sufficient business value and reports to the House and Senate committees on risk mitigation. Another project, Security and Technology Infrastructure Release (STIR), was being preliminarily designed without sufficient requirements definition and economic justification. The STIR project should be directed to complete a security risk assessment as soon as possible, and ensure that STIR requirements and the proposed design solution are economically justified through a business case. (See <i>Tax Systems Modernization: Results of Review of IRS' August 2000 Interim Spending Plan</i>, GAO-01-91, November 8, 2000)



Appendix II: Results of Past GAO Reviews

Spending Plan	Results of GAO Review
3rd Spending Plan (Oct 2000) (\$200 million request)	<ul style="list-style-type: none"> • IRS' plan satisfied the legislative conditions for the use of ITIA funds, and was making important progress towards satisfying the congressional direction on two projects – CAP and STIR. • IRS was making important progress in establishing effective modernization management capability, but important and challenging work remained. Until IRS completed its initiated actions to fully implement its system life cycle methodology and business systems modernization office, and resolve issues concerning the completeness and accuracy of enterprise architecture, it continued to lack key modernization and technical controls. • Five modernization initiatives experienced schedule delays and/or cost increases. However, the third plan did not address whether projects' prior commitments for delivery of promised systems capabilities (requirements) and benefit/business value were being met. • IRS used contractor-provided "rough order-of-magnitude" estimates in preparing the third expenditure plan. IRS planned to validate the third plan's estimates as part of its process to negotiate and definitize contract task orders. Previously, this process resulted in finalized contract costs below the estimates, totalling \$9 million. (See <i>Tax Systems Modernization: Results of Review of IRS' Third Expenditure Plan</i>, GAO-01-227, January 22, 2001)



Appendix II: Results of Past GAO Reviews

Spending Plan	Results of GAO Review
4th Spending Plan (March 2001) (\$128 million request)	<ul style="list-style-type: none"> • IRS' plan satisfied the conditions specified in the appropriations acts. • IRS continued to make important progress in implementing modernization management controls and capabilities. Nevertheless, IRS' modernization management capacity is still not where it should be, given (1) the number of systems acquisition projects that the March 2001 plan identifies as underway and planned and (2) the fact that several of the ongoing projects are entering critical stages in their life cycles. For example, IRS did not have a sufficiently defined version of the enterprise architecture to guide and constrain projects, and employing rigorous configuration management practices. • Due to missing management capacity, key IRS projects were beginning to experience cost, schedule, and performance shortfalls against the commitments the agency made in its third expenditure plan. For example, deployment of the Customer Communications 2001 project was three months behind schedule, and promised system capabilities and associated benefits had been deferred. Also, a critical infrastructure project, STIR, was reported to be 1.5 months late in trying to complete its preliminary design phase (Milestone 3); and the agency was still working to finalize 6 of 19 work products needed to complete the phase. Thus, the project was actually almost five months late. • IRS officials recognized the need to address its modernization management capacity before key ongoing projects moved into critical life-cycle phases, and before additional projects were started. Accordingly, IRS planned or had initiated steps to address these weaknesses. In particular the Commissioner had decided to slow ongoing and new projects, giving priority to putting in place missing management capacity. We believed this decision was prudent and appropriate and made recommendations to ensure IRS followed through on this decision. (See <i>Business Systems Modernization: Results of Review of IRS' March 2001 Expenditure Plan</i>, GAO-01-716, June 29, 2001)



Appendix III: IRS Reported Cost Increases/Schedule Delays

Program/ Project Management Initiative	Commitment Date and Funding as of 3/2001 (\$000)	Revised Commitment Date and Funding (\$000)	Change (%)
Customer Communications Milestone 3 (release 2002)	07/31/01 \$17,787	09/30/01 \$13,696	+2 months -\$4,091 (-23%)
Customer Communications Milestone 4, 5 (release 2001)	5/31/01 \$43,386	10/31/01 \$45,174	+5 months +\$1,788 (4%)
e-Services Milestone 2,3	6/30/01 \$17,879	8/14/01 \$16,819	+1.5 months -\$1,060 (-6%)
Customer Account Management Milestone 2	11/30/01 \$12,135	03/31/02 \$13,100	+4 months +\$965 (8%)
Filing and Payment Compliance Milestone 2,3	11/30/01 \$2,517	01/31/03 \$3,017	+14 months +500 (20%)
Reporting Compliance- Individual Milestone 2	11/30/01 \$6,022	11/30/02 \$10,000	+12 months +3,978 (66%)
Customer Account Data Engine (CADE) Milestone 2,3	4/30/01 \$16,567	6/30/01 \$19,267	+2 months +\$2,700 (16%)
Customer Account Data Engine (CADE) Milestone 4	12/31/01 \$40,038	6/30/02 \$45,338	+6 months +\$5,300 (13%)
Custodial Accounting Project (CAP) TASL B1 B2 Milestone 4,5	7/31/03 \$44,130	03/31/03 \$51,430	-4 months +\$7,300 (17%)

Appendix I
Briefing Slides from December 10 and 11,
2001, Briefings to the Senate and House
Appropriations Subcommittee Staffs



Appendix III:
IRS Reported Cost Increases/Schedule Delays

Program/ Project Management Initiative	Commitment Date and Funding as of 3/2001 (\$000)	Revised Commitment Date and Funding (\$000)	Change (%)
Integrated Financial Services/Core Financial Systems Milestone 2,3	3/31/02 \$8,565	5/31/02 \$8,200	+2 months -\$365 (-4%)
Security and Technology Infrastructure Releases (STIR) Milestone 4	9/30/01 \$25,178	1/31/02 \$31,287	+4 months +\$6,109 (24%)
Virtual Development Environment (VDE)	(thru end of FY01) \$6,340	\$7,693	+\$1,353 (21%)
Program Management Office (formally PPMO)	(thru end of FY01) \$21,716	\$22,448	+\$732 (3%)
Program Management Office (formally PPMO)	(1 st 6 weeks of FY02) \$2,236	\$4,124	+\$1,888 (84%)
Vision and Strategy-Tax Administration (TAVS) Milestone 1	\$8,376	\$8,996	+\$620 (7%)
Internal Management Vision and Strategy (IMVS) Milestone 1	\$4,227	\$4,377	+\$150 (4%)
Configuration Management	(thru end of FY01) \$1,687	\$1,885	+\$198 (12%)
Architectural Engineering Office (AEO)	(thru end of FY01) \$19,670	\$19,906	+\$236 (1%)

Comments from the Internal Revenue Service



COMMISSIONER

DEPARTMENT OF THE TREASURY
INTERNAL REVENUE SERVICE
WASHINGTON, D.C. 20224

February 15, 2002

Mr. Randolph C. Hite
Director, Information Technology
Systems Issues
U.S. General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Hite:

I appreciate the GAO's review of the IRS's Business Systems Modernization (BSM) Plan for FY 2002. The release of the appropriated \$391 million based on the GAO's review will make it possible for us to enhance services to the American taxpayer and improve the efficiency of the IRS operations. I welcome the opportunity to respond to the review and address the issues you raised.

Modernization of the IRS's information systems and business processes is one of the largest and most complex business systems modernization programs ever undertaken. Consequently, we have no clear precedent for charting our course. We continue to mature as an organization while we undergo enormous change and simultaneously support the operations of the agency. We have learned that in any such complex undertaking, continuous changes will occur, and, therefore, we must adjust our plans as we learn. Nevertheless, we are committed to developing a program that employs sound management practices and uses our resources wisely.

We made significant progress in FY 2001 in our BSM program. The IRS implemented its first two modernized systems, Customer Communications 2001 and Customer Relationship Management Examination. Both are delivering business benefits to taxpayers and the IRS. In addition, we made significant advancements on many other projects slated for FY 2002 delivery including:

1. Internet Refund/Fact of Filing (which will allow taxpayers to use the Internet to check on the status of their refunds),
2. Customer Account Data Engine Release 1 (a pilot of the first part of the modernized individual taxpayer data base),
3. A production pilot of HR connect (a human resources management system being implemented Department-wide by Treasury), and
4. E-services (electronic problem resolution and relationship management for third party practitioners).

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Further, the first release of the Enterprise Architecture was delivered last January, as well as a major upgrade in May. The Enterprise Architecture includes a technical architecture, high-level business processes and an enterprise transition plan based on Tax Administration and Internal Management Visions and Strategies. An updated release is in progress for completion later this year.

We have made important progress in implementing key infrastructure components needed to support future development and operation of BSM systems, such as new hardware and systems software, a robust testing environment, Internet portals, security infrastructure, and systems and network management capabilities. We have leveraged other resources within the Modernization, Information Technology and Security (MITS) Services organization, such as security, product assurance, and production operations.

We have also made progress in Program management over the past year. A network of Executive Steering Committees, chaired by senior IRS executives and with broad business participation, are key elements of our BSM Program management structure. Project advisory councils, business process owners, our Enterprise Life Cycle Methodology, and a network of systems engineering and change control boards are all operating effectively. In addition, we redesigned our management meetings to increase communications, control, and address critical management and integration issues on a more timely basis.

The combination of improvement management processes and a stronger executive management team has kept the Program under control. Further, as noted in the GAO Report, we made important progress in implementing key management processes, such as Configuration Management and Risk Management, though we acknowledge that further improvements are needed before these management processes are implemented fully. We will review with the GAO our commitment to achieving full implementation as soon as practical.

We have addressed many of your recommendations, such as prudently slowing existing projects and deferring new projects when management capacity is inadequate to proceed with acceptable risk.

GAO's Report cites 18 projects that "have experienced cost and/or schedule shortfalls against commitments made in the fourth and other prior plans." Many of the variances from plan are minor (less than 10 percent), and several were cases where actual costs were less than estimated (the total variance across all 18 projects is under 10 percent). Also, in many cases, these variations were the result of prudent management actions (formally approved by either the Core Business Systems Executive Steering Committee or the appropriate Sub-ESC, and reviewed with GAO and OMB). Examples include deferring the Enterprise Systems Management project to align its testing schedule with other products to reduce overall cost, and deferring the start of Reporting Compliance due to lack of management capacity.

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Many of these commitments were simply planning estimates made early (prior to Milestone 3 exit) in the project life cycle (ELC). Our track record demonstrates effective control of BSM projects. However, we agree with the GAO that all management processes must be implemented fully since the complexity of the Program will increase dramatically as we go forward. We are neither complacent nor satisfied with our present capabilities. We will provide a full explanation of the root causes of each of the cost or schedule differences in a separate communication.

In addition to the internal management controls that are in place, those we are adding, and the legal controls that we operate under, the BSM Program performs in an exceptionally open environment, under special legislative controls, and with a rigorous and effective governance process. These controls, as well as our own management judgment, ensure that we have adequate management capacity and an acceptable risk before starting future work. The GAO has indicated that we need to do a better job of explaining all unmet commitments in prior Plans in the current expenditure Plan, and we will do so. BSM executives will continue to hold weekly meetings, as we have done throughout FY 2001, with the GAO to inform you of events as they occur.

I agree with your recommendations and have set target plans and schedules to fully implement Configuration Management, Risk Management, and cost and schedule estimating processes, as well as your recommendations in human capital management and other areas. We have reviewed these target dates with your office. In addition to the dedicated staff assigned to these improvements, both the IRS and PRIME have appointed senior executives to coordinate within and across our respective organizations to ensure we give top priority to completing their implementation.

Regarding your recommendation to achieve the Software Engineering Institute's Software Acquisition Capability Maturity Model (SA-CMM) Level 2 certification, we have made progress. We acknowledge that this has taken longer than we expected, and our past commitment to achieve this by September 2001 was unrealistic, based on how long other organizations are taking to achieve this level of certification.¹ I believe our plan is now reasonable, we have developed these plans working closely with MITRE, the Systems Engineering Institute of Carnegie Mellon University, and the PRIME contractor, who has already achieved this certification level in their Civilian Government Group.² This thorough preparation and planning ensures that we have a realistic approach to achieving SA-CMM Level 2 certification as targeted.

Regarding your recommendation to align the pace of the program with the maturity of the BSM Organization's management controls and management capacity, we agree and are committed to comply. To illustrate, we are conducting a Portfolio Reassessment for the FY 2002 plan, with participation from IRS's business units, MITRE and PRIME. Our Core Business Systems Executive Steering Committee will approve this reassessment.

¹ Only one other government organization, the Abrams Battle Tank Program in the Department of Defense, has achieved SA-CMM Level 2 certification, and they just did so last November.

² CSC's Civilian Group was the first organization to achieve SA-CMM Level 2, and expects to receive their SA-CMM Level 3 certification soon.


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We recently completed a major effort to "refresh" the Tax Administration Vision and Strategy (TAVS), which looks ahead to FY 2003 and beyond, and will "institutionalize" the value of this vital program asset. In all these reviews, we look for opportunities to make prudent adjustments to the program plan to lower execution risk. We are proactively keeping all of our stakeholders informed of any changes we make as a result of the Portfolio Reassessment process, and we plan to conduct regular Portfolio Reassessments in the future.

We must maintain the momentum created in FY 2001 as we move into FY 2002 and beyond, both to deliver benefits to taxpayers and IRS employees to maintain strong buy-in from IRS executives and other key stakeholders. Hence, we need to strike a proper balance between delivering business value, building critical infrastructure, and implementing the management processes necessary to ensure control and effectiveness. We believe our FY 2002 Expenditure Plan strikes this balance, but will continue to reexamine our commitments as per the GAO's recommendations.

IRS leadership understands the importance of correcting the issues you identified and is moving aggressively to resolve them. I appreciate your acknowledgement of the important progress we made. I also appreciate your hard work in preparing your comprehensive report, your support of the BSM Program, and your ongoing counsel.

Sincerely,



Charles O. Rossotti

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